

the distribution of ammonia at different altitudes. Examining the atmosphere from this point of view, MM. Müntz and Aubin now find that at an elevation of nearly 3000 m. the quantity does not sensibly differ from that at extremely low levels, which is ascertained to be about 1.35 mgr. to 100 c.m. Hence the diffusion of ammonia in the air is as complete as that of carbonic acid. Consequently it is in the gaseous state that this substance is incessantly transmitted from the marine basins to the atmosphere. The rain and snow collected on the Pic du Midi also revealed the presence of ammonia in solution, as was to be expected.

*Atmospheric Nitritification.*—The analysis of rain falling during thunderstorms is known invariably to yield certain nitrous compounds in the form of sal ammoniac. From what is known regarding the affinities of nitrogen, it is argued that these compounds are developed under the influence of electric discharges. The nitrous compounds (nitric acid and sub-nitric acid) are converted, in the presence of water and of ammonia, into sal ammoniacs, which are precipitated by the rain. Hence electric disturbances in the air came to be regarded as the chief source of nitrous compounds.

MM. Müntz and Aubin have analysed by the most delicate processes the rain-water collected on the Pic du Midi, but never succeeded in detecting any nitrates in it, although they are always present in rain-water collected on the plains. Their absence corresponds with the absence of thunderstorms taking their rise above the Pic du Midi. Of 184 storms observed during a period of nearly nine years by M. de Nansouty, the director of the Observatory, not more than twenty-three originated at an altitude of over 2300 m.; but in no case were electric phenomena observed at an elevation higher than 3000 m. Hence the electric discharges, which give rise to the nitrates, are limited to the lower atmospheric regions between sea-level and 3000 m. above the sea.

To the general results here resumed MM. Müntz and Aubin have added some details concerning the formation of vegetable soil. They have distinctly determined the presence of nitric ferment in the ground on the highest summits. But owing to the low temperature prevailing at those altitudes, the activity of this ferment is extremely weak.

It may be observed in conclusion that the uniform proportion of carbonic acid and ammonia in the atmosphere, as determined by these remarkable researches, is a fresh confirmation of Schösling's theory regarding the interchange of gases between the sea and the air. The marine basins are incessantly discharging or absorbing carbonic acid and ammonia in such a way as to maintain the constant proportion of these substances. They thus constitute a vast regulator, restoring to the atmosphere the nitrous or carbonic compounds of which it had been deprived by vegetation.

### SCIENCE IN ROME

THE recent changes introduced into the constitution of the Accademia dei Lincei, followed by its removal to new and sumptuous quarters in Trastevere, seem to call for more than a passing notice. There are certainly many other famous societies scattered over the Peninsula, all the large towns of which have long possessed one or more scientific, literary, or artistic corporations. But, with perhaps the single exception of the Florentine Academy, none of them have been so intimately identified with the progress of the physical sciences since the "Renaissance" as this oldest of still existing learned institutions. Founded on August 17, 1603, by the young prince, Federigo Cesi, for the express purpose of cultivating "le scienze matematiche e filosofiche," it began its useful career forty years before the birth of Newton, and six before Galileo had rendered

Jansen's telescope a suitable instrument for astronomic observation. The very name of the Lincei, or "Lynx-eyed,"<sup>1</sup> breathes the quaint spirit of the times, when every capital in Italy had its centres of intellectual movement, bearing such eccentric titles as the Accademia dei Sonnacchiosi ("The Drowsy"), dei Sitibondi ("The Thirsty"), dei Svegliati ("The Wide-Awake"), degli Ottusi ("The Dull"), degli Innomati ("The Nameless"), dei Storditi ("The Dazed"), dei Tenebroso ("The Darklings"), and so forth. But while most of these ephemeral corporations have left little but their names behind them, the Lincei have gone on prospering and continually widening the field of their utility until the Academy now finds itself formally constituted the chief national exponent of the natural sciences in Italy, thus taking rank with the French Institute and the Royal Society of London.

Although such a proud position could scarcely have been anticipated by its founder, the Academy none the less possessed from the outset certain elements of stability, which under favourable circumstances could not fail to insure it a prolonged existence. Its generous patron not only provided it with a home in his ancestral palace, but also placed at its disposal a botanical garden, a rich museum and a choice library soon increased the valuable collection of Virginio Cesarini. Its three first members, the founder, Fabio Colonna, and Francesco Stellati, were all noted for their varied accomplishments, and Colonna especially, at once a mathematician, philosopher, painter, musician, and *savant*, may be regarded as the greatest of botanists previous to Linné.<sup>2</sup>

During the seven first years after its foundation, Gaetano Marini tells us that the Academy "dared to stand up against the tyranny of the Peripatetics, and to introduce a new and more certain method of philosophy, bravely and religiously enduring a long and most unworthy persecution" (*Ist.* i. p. 493). The reference in the last clause, necessarily worded somewhat vaguely, is to the action taken by the Lincei in defence of Galileo, who had joined the Academy, and who had in 1615 received his first summons to Rome to recant his "errors." A feeble attempt seems to have been made to continue the struggle between light and darkness till 1632, when Galileo was finally "suppressed." The "Lynx-eyed" were now shrewd enough to perceive that they had fallen upon times when silence was "golden." Henceforth for many years their records are practically a blank, broken only in 1651 by the publication under their auspices of Francisco Hernandez's great work on the natural history of Mexico.

After the untimely death of Prince Cesi in 1630 the Academicians, now numbering thirty-two members and foreign associates, received a temporary shelter in the house of the Commendator Cassiano del Pozzo. Their first organic constitution had been issued in 1624, and since that period both residence and regulations have been subjected to many changes. After the political unification of Italy and the selection of Rome for its capital, fresh modifications became inevitable, and a new constitution was published in the year 1875. But so rapid has been the progress of the natural sciences, and so great the zeal displayed by the Lincei in the cause for which their predecessors endured "a long and most unworthy persecution," that further alterations in the sense of expansion were soon felt to be imperative. According to the reform introduced in July 1883, better provision is made for the cultivation of all branches of physics by the final and absolute exclusion of the arts and letters. The new

<sup>1</sup> Tarboschi tells us that this title was adopted "per chè gli accademici presero a lor simbolo un lince, a spiegar l'acutezza con cui si erano prefissi di osservare e di studiar la natura" (viii. p. 72).

<sup>2</sup> "Quicumque," says Boerhaave, "historiam antiquitatis plantarum scire vult, legat opera Fabii Columnæ, qui vix habet similem, sed quidem imitator" ("Method. discend. Medic." pars 4, § 8). Colonna, who was born in Naples in 1567, and died an octogenarian in 1647, was also the inventor of the musical instrument by him named the "sambuco linceo," in honour of the Academy.

conditions have of course necessitated this departure from the original scope of the Institute, which, as we are expressly told by Tiraboschi, did not exclude the "humanities."<sup>1</sup> The scheme of the natural sciences itself has also been entirely recast, with a corresponding increase and redistribution of members among the various sections. As regards foreign membership the Lincei take the lead in an important innovation, which will doubtless be adopted in due course by the great scientific institutes of other countries. In a truly "international" spirit, they henceforth practically abolish the distinction between *Associates* (Soci, or home members) and *Correspondents* (Corrispondenti, or foreign members). The clause bearing on this point in the President's Circular of June 26, 1883, deserves to be here quoted in full:—

"Per ciò che concerne gli stranieri fu unanime il pensiero di togliere la distinzione fra i Soci ed i Corrispondenti: distinzione la quale riferendosi a pochi personaggi eminenti nelle scienze a cui attendono e disseminati in tutto il mondo civile, riesce difficilissima e di utilità molto dubbia. Per le scienze fisiche, matematiche, e naturali parve necessario un aumento nel numero degli stranieri aggregabili all' Accademia, non solo per dare una dimostrazione d'onore a personaggi così benemeriti, ma anche per agevolare le relazioni scientifiche le quali si fanno ogni giorno più frequenti, più necessarie, e più intime fra i cultori delle stesse scienze ed i direttori di analoghi stabilimenti scientifici, indipendentemente dai confini politici che li separano."<sup>2</sup>

Amongst the foreign *savants* who thus receive full membership, occur the names of Airy, Adams, Lockyer, and Huggins in Astronomy, Ramsay in Geology, Hooker in Botany, Huxley in Zoology, Cayley and Roberts in Mathematics, Whitney in Philology, Freeman in History and Geography, Gladstone in Social Science.

As reorganised under the new constitution, the Academy consists henceforth of two classes: (1) Physical, Mathematical, and Natural Sciences; (2) Moral Sciences,—distributed into a number of Categories and Sections as under:—

CLASS I.				
Categories	Sections			Members
1. ...	Mathematics ...	...	...	15
	Mechanics ...	...	...	11
	Astronomy ...	...	...	11
	Geography (Physical) ...	...	...	4
2. ...	Physics ...	...	...	17
	Chemistry ...	...	...	8
3. ...	Crystallography and Mineralogy ...	...	...	9
	Geology and Palæontology ...	...	...	11
4. ...	Botany ...	...	...	9
	Zoology and Morphology ...	...	...	8
5. ...	Agronomy ...	...	...	3
	Physiology ...	...	...	6
	Pathology ...	...	...	3

CLASS II.				
Categories				Members
1. Philology ...	...	...	...	17
2. Archæology ...	...	...	...	19
3. History and Historical Geography ...	...	...	...	16
4. Philosophy ...	...	...	...	15
5. Jurisprudence ...	...	...	...	10
6. Social Science ...	...	...	...	21

On May 14, 1881, an Act was passed granting a large sum for the purpose of erecting or purchasing a suitable edifice for the Lincei, henceforth officially recognised as the "Royal Academy of Sciences." After protracted negotiations, an arrangement was made with Prince Tommaso Corsini, in virtue of which for the sum of 95,400*l.* the Academy acquired the perpetual use of the magnificent Palazzo Corsini, situated in the Via della

Longara, Trastevere. The purchase, which was effected in May 1883, included the furniture, fittings, gardens, and annexes, but not the Library and Pinakothek, which, being entailed, the prince had no power to alienate. To meet this difficulty a special Act was subsequently passed, which removed the entail, and enabled the prince to make a free gift of the Pinakothek to the nation, and of the Library to the Accademia dei Lincei. The Library, originally collected by Cardinal Neri Corsini, and bequeathed by him in 1774 to his nephew, Duca don Filippo Corsini, comprises the prints, drawings, books, and manuscripts occupying the nine rooms on the first floor of the north side of the building so well known to English visitors in Rome. It passes to the Lincei on the condition of being preserved by them for the public use under the name of the "Biblioteca Corsiniana." It is also to be kept for ever not only in Rome, but in Trastevere, as set forth in the disposition of its chief founder, Cardinal Neri Corsini. Some of our readers may possibly remember the two allegorical busts at the main entrance of the palace. These are now to be replaced by busts of the Cardinal and of Prince Tommaso Corsini, with inscriptions recording their services to the cause of the arts and sciences. The prince also receives from the Academy the gift of a complete copy of its *Atti* or *Proceedings*, of which there are three series: (1) under the Pontifical "dispensation," 23 vols.; (2) 1873-76, 8 vols.; (3) 1876-83, 7 vols. On the yellow wrapper of the present series the tiara gives place to the royal crown of Italy above the lynx, and the Lincei pass from the shadow of the now silent Sant' Uffizio to a right royal residence on the banks of yellow Tiber.

A. H. KEANE

#### NIELS HENRIK CORDULUS HOFFMEYER

WE have already (p. 387) briefly referred to the death of Capt. Hoffmeyer; the importance of his work in meteorology deserves more detailed notice.

Capt. Hoffmeyer was born at Copenhagen, June 3, 1836. His father was Col. A. B. Hoffmeyer. He commenced his studies with a view to a professional career, but the idea was soon abandoned, and he was entered as a pupil in the military academy. At the age of eighteen he became an officer, and on completing his studies he received an appointment in the artillery service.

He was engaged in the Schleswig-Holstein war of 1864, but as early as February he was compelled by illness to retire from active service. In early youth he had suffered from rheumatic fever, and the exposure and fatigues of the winter campaign soon laid him prostrate with another severe attack of the same fever. On the reduction of the army at the close of that year, Capt. Hoffmeyer was placed on the retired list.

He spent the early part of the summer of 1865 recruiting his health at Sophienbad, a watering-place near Hamburg, and in August he proceeded to Paris, where and at Nantes he remained a year studying the works carried on at the iron foundries there. On his return to Denmark he took an active part in establishing a similar foundry at Christiansholm, but in 1867 he was appointed to a post in the War Department, and became at the same time a captain of the militia of Copenhagen.

It was while residing in France that Hoffmeyer's attention began to be directed to meteorology. At that time, fortunately, the principles which distinguish modern meteorology were being developed and prosecuted by the genius and energy of Leverrier, in the daily publication in the *Bulletin International* of a weather map for all Europe, which had been begun only two years before. After his appointment to the War Department, he devoted his energies with characteristic ardour to the study of meteorology, and when the Danish Government established the Meteorological Institute in 1872, Capt. Hoffmeyer was appointed director.

<sup>1</sup> "E benché il principal loro oggetto fosser le scienze matematiche e filosofiche, non trascuravano però l'amena letteratura e gli studi poetici" (viii. p. 73).

<sup>2</sup> As finally modified in the new articles, the clause affecting foreign members runs thus:—"I soci stranieri sono equiparati ai nazionali allorché essi sono in Italia."